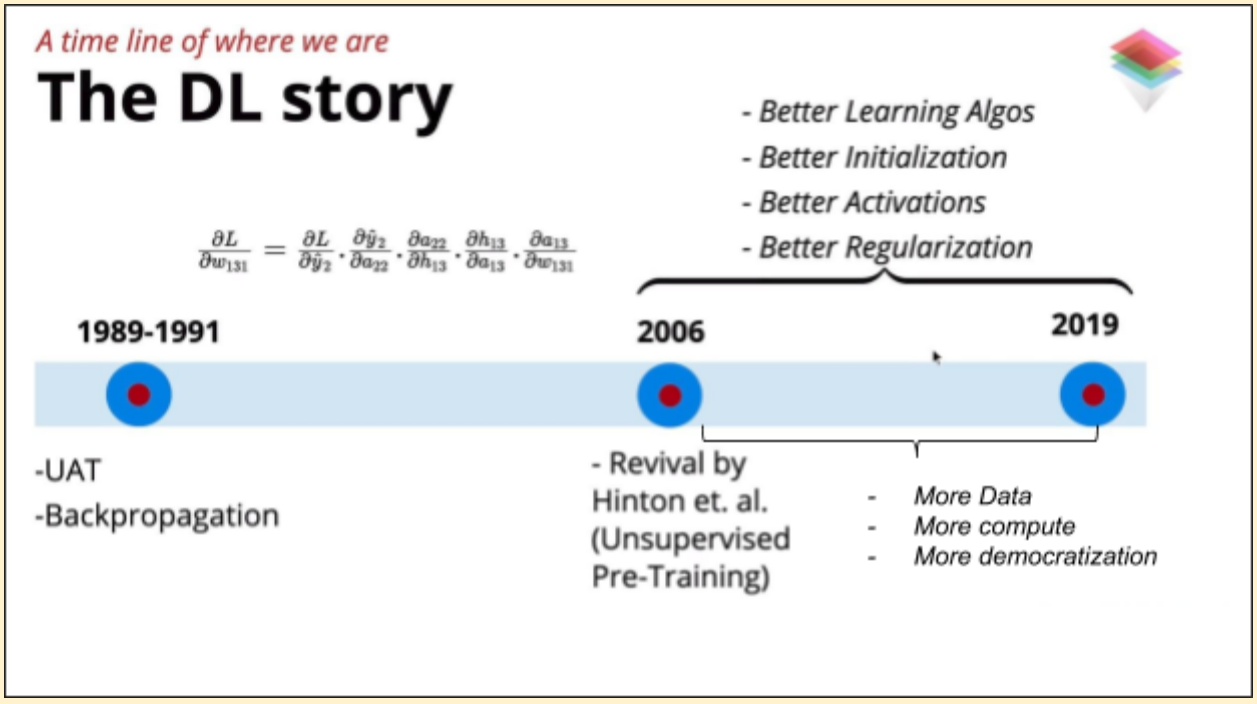
PadhAI: Variants of Gradient Descent

One Fourth Labs

Optimization Algorithms

A quick history of DL to set the context

1. The following illustration shows the progress of Deep Learning over the last 3 decades



2. Some of the salient points in the DL-timeline are as follows
   a. **1989-1991**
      i. Universal Approximation Theorem: we will be able to approximate any kind of function with our Neural Network
      ii. Backpropagation: Derivative calculation happens backwards from the output layer to the input, ie back propagation. It is nothing but Gradient Descent(**1847**) applied with the chain rule
   b. **1993-1994**
      i. A lot of work was done on Recurrent Neural Networks
   c. **1998**
      i. LSTMs (Long Short-Term Memory) were proposed
      ii. Work done on Convolutional Neural Networks
   d. **2006**
      i. Revival of DL by Hinton et. al. with the proposal of Unsupervised Pre-training
      ii. People's interest in DL started increasing.
   e. **2019**
      i. Better Learning Algorithms, Initializations, Activation and Regularization
      ii. More Data, compute and democratization.